

# Effects of Manual Therapy on Bowel Function of Patients with Spinal Cord Injury

CHUNYING HU, MSc, PT<sup>1)\*</sup>, MIAO YE, PT<sup>1)</sup>, QIUCHEN HUANG, MSc, PT<sup>1)</sup>

<sup>1)</sup> Department of Physical Therapy, China Rehabilitation Research Center: 10 JiaoMen North Road, FengTai District, Beijing 100068, China. TEL +86 10-87569510

**Abstract.** [Purpose] The purpose of this study was to observe the effects of manual therapy on bowel function of patients with spinal cord injury. [Subjects] The participants were 20 patients with spinal cord injury. [Methods] Manual therapy was applied to the intestine and along the colon ascendens, transverse colon, colon descendens and colon sigmoideum on the surface of abdomen. The results before and after 60 sessions (5 times/week, continued for 12 weeks) of manual therapy were compared. [Results] It was found that there were significant effects both on shortening of bowel time and decreasing dosage of glycerine enema every time patients needed to excrete. [Conclusion] Manual therapy had significant effects on bowel function of patients with spinal cord injury.

**Key words:** Manual therapy, Bowel function, Spinal cord injury

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## INTRODUCTION

Voiding dysfunctions are commonly encountered in patients who are referred for rehabilitation. These voiding problems may result from medication, cognitive changes, physical impairments, or neurological etiologies<sup>1)</sup>. Patients with spinal cord injury in the thoracic region were selected for this study, and we monitored changes in their bowel function after performing manual therapy along the colon. At the early stage of injury, the internal layer of the rectum and the anal sphincter muscle are in a stage of complete incontinence<sup>2)</sup>. The reflex of the voiding function is restored by recovery of the central lumbar-sacral spinal cord after the acute stage<sup>3)</sup>. Peristalsis of the intestine and right side colon are maintained by innervation from the vagus nerve so that feces are transported to the large intestine. After spinal cord injury, patients suffer from many kinds of problems such as decreased muscle power and sensation, and impairment of the respiratory system and other functions. Especially, spinal cord injury causes paralysis and high spasticity of the anal sphincter, or results in problems of voiding dysfunction<sup>4)</sup>. In this study, we selected patients with thoracic and lumbar spinal cord injury for treatment with manual therapy, as an intervention for defecation function. Our objective was to improve and enhance bowel function, to achieve the goal of patients' independence in activity of daily living (ADL).

## SUBJECTS AND METHODS

Twenty in-patients with spinal cord injury were selected at a hospital. There were 13 males and 7 females (mean age

$39.70 \pm 5.25$ ). Table 1 shows the basic characteristics of the participants.

The content of therapy included exercise therapy, setting up the habit of defecation (i.e. have a bowel movement at a regular time every day), maintaining a stable psychological status of patients, drinking a certain quantity of water, having food fiber, mechanical stimulation and combination medication. Manual therapy was applied to the patients' abdomen to modulate tension and improve peristalsis of the colon. A secondary goal was to exercise the pelvic floor muscles to help the patients to excrete. Each patient was positioned in supine lying, with the hip and knee flexed at 90 degrees, with both legs on the therapist's thigh to completely relax the patient's abdomen. Then, the therapist pressed down and pushed along the colon ascendens, transverse colon, colon descendens and colon sigmoideum on the surface of the abdomen. This massage was performed to improve the peristalsis of the large intestine. Vibration stimulus was applied to the small intestine through the abdomen. If tension or spasm appeared in the abdomen, the therapist inhibited two key points, one point being 2 fingers above the patient's umbilicus, and the other point being to the right and below, 1/3 of the distance between the umbilicus and anterior superior iliac spine (ASIS). The fingers were pressed down on two points until the tension or spasm in the abdomen was released. The duration of the treatment was 3 months. During this period, the dietary habit did not change and the amounts of food and water taken were the same as before. The paired t-test was used to compare excretion timing and dosages of glycerine enema before and after treatment. A value of  $p < 0.05$  was considered statistically significant. The software package SPSS 17.0 was used for statistical analyses.

\*To whom correspondence should be addressed.  
E-mail: christinehcy@163.com

**Table 1.** The data of subjects

	Mean ± SD
Age (Y)	39.7±2.25
Height (cm)	168.8±7.2
Weight (kg)	66.1±9.01

## RESULTS

All the subjects enrolled in the study receiving manual therapy 5 times a week for 12 weeks. All the subjects in this study were included in the data analysis. All the subjects seemed to be very comfortable after manual therapy for the abdomen after 2 days to 1 week. Some patients reported their feces could be excreted in 2 hours after manual therapy was implemented. The statistical analyses found significant differences in both timing of bowel movement and dosage of glycerine enema. A statistically significant improvement was found in the mean time of bowel movement; it decreased from  $94.00 \pm 16.35$  minutes to  $60.50 \pm 10.50$  minutes after receiving manual therapy for 3 months. The dosage of glycerine enema was decreased from  $68.05 \pm 8.90$  mL to  $31.50 \pm 11.82$  mL (Table 2,  $p<0.01$ ). Therefore, the methods of manual therapy and stimulation of key points on the abdomen effectively improved the bowel function.

## DISCUSSION

According to the results, bowel function was improved by manual therapy. The main purpose of the excretion therapy was to evacuate fecal matter from the colon in a regular interval time. For spinal cord injury patients, the spinal reflex recovers gradually, so therapy for bowel function is necessary during this period. The large intestine serves to desiccate the fecal matter as it is transported from the ileum to the rectum<sup>5)</sup>. Therefore, methods should be used to stimulate the colon sigmoideum at a certain time for the patient. Clolxyl and dantron were usually administered to make fecal matter soft. Besides this, in order to stimulate the stomach and the colon, patients drank a hot drink slowly before receiving manual therapy for the abdomen. If the rectum reflex was areflexic due to upper motor neuron injury, lubricant oil was applied inside the anus to stimulate the rectum with a finger.

The kind of food and water content has great influence on bowel frequency and the hardness of fecal matter. Some foods that are rich in vitamins, raw vegetables, fruit, cold water and milk soften fecal matter and promote peristalsis of the gut. The quantity of food and the meal time play very important roles in establishment of the habit of defecation<sup>6)</sup>. They greatly help to increase patient's ability of ADL and social participation. For example, it is necessary to teach patients to establish regular habits, to control their bowel function, and to keep good habits in ADL, they must maintain a certain exercise regime or do some exercises when they are sitting in a wheelchair. We emphasize that plenty of water in the food must be taken by patients in each meal everyday, otherwise there will be difficulty in defecation if

**Table 2.** Before and after of treatment comparison in of glycerine enema volume

	Before	After
Glycerine Enema (ml)	$68.1 \pm 8.9$	$31.5 \pm 11.8^{**}$
Time of bowel (minutes)	$94.0 \pm 16.4$	$60.5 \pm 10.5^{**}$

\*\* $p<0.01$

the fecal matter becomes over desiccated.

Although spinal cord injury patients want to have bowel movement everyday, they will exhaust much energy and time, and also they will feel fatigue easily after they have defecated. One evacuation every 2–3 days is appropriate for such patients. It becomes difficult to defecate if fecal matter is kept in the colon over 3 days. It is dangerous to cause paralytic ileus if fecal matter is kept in the colon for a long time. The best timing for evacuation is after breakfast, it can stimulate gastro-intestinal reflex hyperthyroid activities to make evacuation easy. Moreover, a training plan for defecation should be set according to the lifestyle habits of the patient and implementation of the plan for defecation management<sup>7)</sup>.

Several kinds of ability for defecation free of joint motion, residual muscle power and sensation (patient can look from mirror if no sensation around anus), sitting balance, hand function (ability to use auxiliary device) and transfer ability, are needed for spinal cord injury patients. If patients need to succeed at defecation independently, they must make flexible use of the abilities mentioned above, as well as exercise rolling and taking off and putting on clothes. In addition, patients should be trained to look in a mirror and insert a turunda into the anus with an auxiliary device while lying on their sides. If patients need to transfer to a sitting toilet, they must have the ability to take off their trousers and transfer on the toilet pedestal within five minutes of inserting a turunda into the anus. After the training process for the above, patients can achieve this independence goal gradually, and they can check their bowel movements themselves as well as cleaning the anus with an auxiliary device after a bowel movement.

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